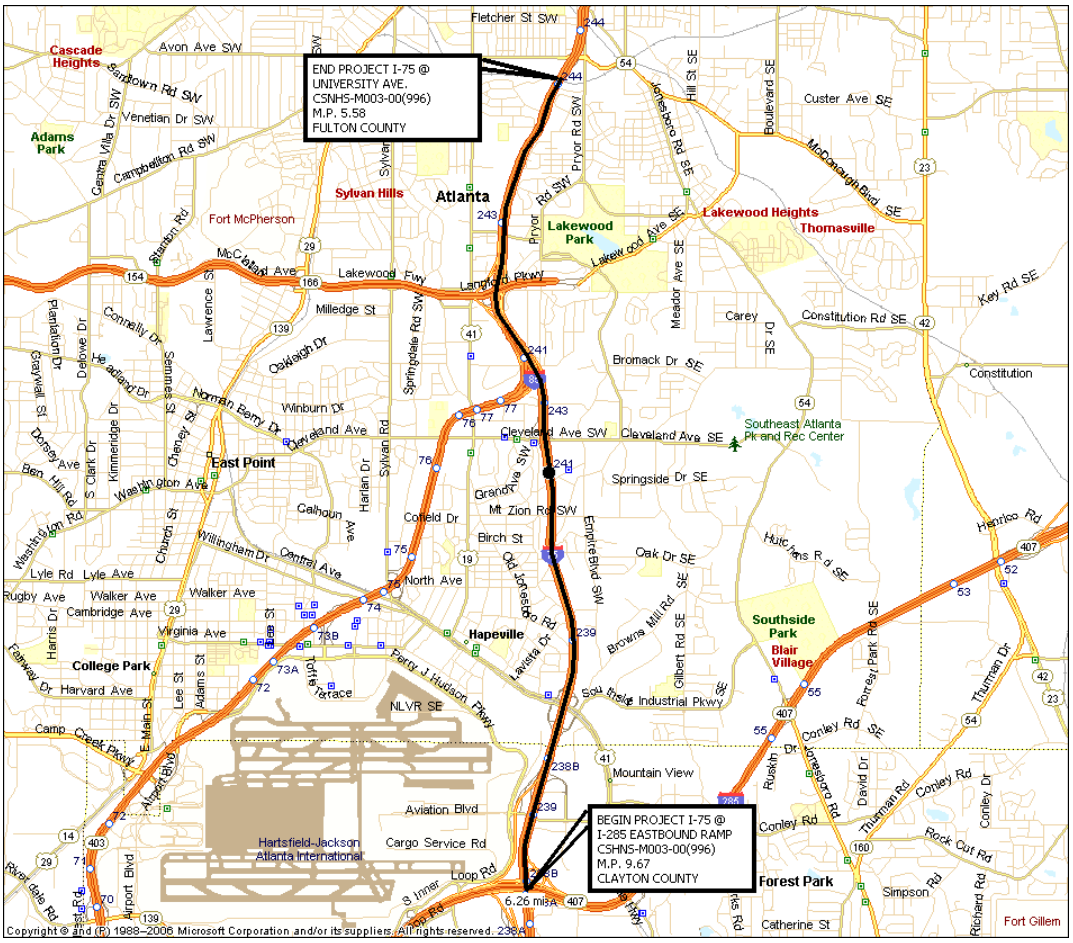
Value Engineering Study Report

Georgia Department of Transportation
CSNHS-M003-00(996) – P.I. No. M003996
I-75 / SR 401Resurfacing
Fulton & Clayton Counties



Value Engineering Team

Design Team

May 8, 2009

May 12, 2009

Ms. Lisa Myers
Design Review Engineer Manager/VE Coordinator
Georgia Department of Transportation-Engineering Services
One Georgia Center
600 W. Peachtree Street NW
Atlanta, GA 30308

RE: Submittal of the final Value Engineering Report I-75 / SR 401Resurfacing
Project Nos.: CSNHS-M003-00(996) – P.I. No. M003996
Fulton & Clayton Counties

This Value Engineering Study, which was performed on May 8, 2009, identified **6 *alternatives*** of which **4 are recommended for implementation**. We believe that these ***Ideas*** may have a significant positive affect on the project.

We trust that you will find this report to be in proper order. It should be noted that the results of this workshop are volatile in that they can be overcome by the events that accompany the expeditious continuance of the design process. Accordingly, we encourage an equally expeditious implementation meeting to design the disposition of the contents of this report.

On behalf of our VE Team, we thank you very much for this opportunity to work with you and the hard working staff of the Georgia Department of Transportation.

Yours truly,

PBS&J

Alan K. Adelgren, P.E., CVS-Life
VE Team Leader

Value Engineering Study Report

Project No. CSNHS-M003-00(996) – P.I. No. M003996

Resurfacing of I-75 / SR 401

Fulton & Clayton Counties

Table of Contents

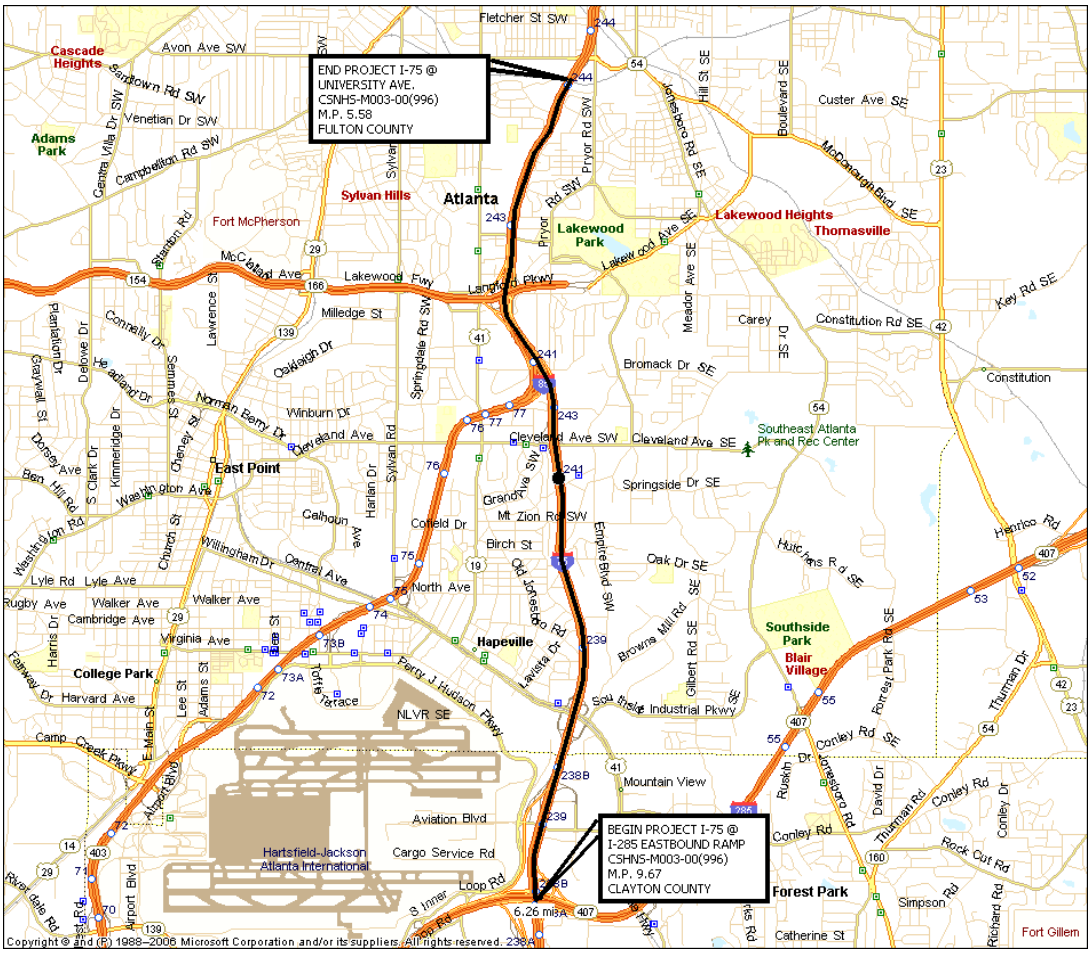
EXECUTIVE SUMMARY

PROJECT OVERVIEW

This report summarizes the analysis, conclusions, and recommendations by the PBS&J Value Engineering workshop team as they performed a Value Engineering Study on May 7, 2009, in Atlanta, at the office of the Georgia Department of Transportation. The subject of the study was Project CSNHS- M003-00(996) - P.I. No. M003996. The project involves the resurfacing of a portion of Interstate-75 / State Route 401 in Fulton & Clayton Counties.

PROJECT DESCRIPTION & LOCATION

Project number CSNHS-M003-00(996) involves maintenance resurfacing along the northbound and southbound lanes of I-75 / SR 401 from the south end of the Norfolk Southern Bridge in Fulton County to north of the I-285 / SR 407 Interchange in Clayton County. This condition will continue to deteriorate as traffic volumes increase. The project would deep mill and inlay existing asphaltic concrete pavement along I-75 in Fulton and Clayton Counties. Construction will be staged, and will involve temporary single- and double-lane closures. The project is 6.309 miles in length.



Consists of 12 lanes, 6-12 foot lanes in each direction. Outside shoulders are 12 feet wide (10 feet paved). The inside shoulders vary from 5 to 6.75 feet paved. The median varies from 12.5 to 16 feet wide with a 2.5- foot median barrier.

The present traffic count ranges based upon location along the project route. The observed low count is 136,900 vehicles per day on the section from Aviation Blvd to SR 407/I-285. The observed high count is 277,650 vehicles per day on the section from University Ave to SR 166/Arthur Langford Pkwy.

The estimated construction cost for the project is $ 26,608,284.84.

PROJECT CONCERNS AND OBJECTIVES

Some of the information from the concept report and the designer's presentation indicated the following important points about the project:

- Comply with Standards
- Need to improve safety
- Re-establish rideablility

CONCLUSIONS AND RECOMMENDATIONS

During the speculation phase the VE Team identified **6** ***alternatives*** that appeared to hold potential for reducing the construction cost, improving the end product, and/or reducing the difficulty and time of project construction.

After the evaluation phase was completed, the team had selected ***4*** *of the* ***alternatives for final development.*** These recommendations are presented in the ***Study Results***.

Summary of Project Recommendations

PROJECT: **Georgia Department of Transportation**
CSNHS-M0043-00(996) – P.I. No. M003996
Fulton & Clayton Counties
I-75 / SR 401 Resurfacing

SHEET NO.: **1** of **1**

IDEA NUMBER	DESCRIPTION OF RECOMMENDATION	
1	Use OGFC in lieu of PEM	4
2	Review special provisions section 150 – Traffic Control	5
3	Coordinate liquidated damages language between Special Provisions Section 108 and Section 150; increase LD's for lane closures.	5
5	Delete engineers office	5

Rating: 1→2 = Not to be Developed; 3 = Varying Degrees of Development Potential; 4→5 = Most likely to be Developed
C = Combined With (Idea Number); DS = Design Suggestion; ABD = Already Being Done; OB= Observation

Value Analysis Project Recommendation

PROJECT:	**Georgia Department of Transportation** **CSNHS-M0043-00(996) – P.I. No. M003996** **Fulton & Clayton Counties** **I-75 / SR 401 Resurfacing**	ALTERNATIVE NO.: **1**
DESCRIPTION:	**Consider using OGFC in lieu of PEM**	SHEET NO.: **1** of **1**

Original Design:

The original design calls for the use of a 12.5mm PEM drainage surface.

Alternative:

The alternative proposal suggests considering the use of 12.5mm OGFC as the drainage surface.

Opportunities:

- Reduces paving costs
- Would not alter existing profile grade
- Reduces milling costs/quantities

Risks:

- None identified

Technical Discussion:

The alternative proposes the consideration of OGFC as a drainage course in lieu of the PEM that is currently designed. The OGFC could be placed in thinner lifts (90LB/SY for OGFC, 135LB/SY for PEM) resulting in a reduction of approximately 30% of the estimated quantities of PEM.

Using OGFC would allow tie-in to existing bridge approach slabs and other associated fixtures without adjustments to the existing profile grade line. The use of OGFC would allow for uniform milling operations, and no adjustments vertically. The use of OGFC would also reduce milling quantities since a deeper milling was required to maintain the existing profile grade by using PEM. Milling depths could be reduced by just under ½" throughout the mainline roadway.

According to the GDOT Mean Item Summary, the average let cost per ton for the PEM item is 400-3624, which is $80.94/ton. The estimated cost for OGFC is 400-3206 is $72.96/ton, resulting in comparable cost savings even before cost saving realized by utilizing the thinner application.

Value Analysis Project Recommendation

PROJECT:	**Georgia Department of Transportation** **CSNHS-M0043-00(996) – P.I. No. M003996** **Fulton & Clayton Counties** **I-75 / SR 401 Resurfacing**	ALTERNATIVE NO.: **2**
DESCRIPTION:	**Review Special Provision Section 150 – Traffic Control**	SHEET NO.: **1** of **1**

Original Design:

1) Section 150.11 L-3 Complete Paving Operations establishes a 30 calendar day time period for the contractor to complete all paving operations once milling and paving begins. General Note #4 establishes a 180 calendar day time period for the contractor to complete all paving operations once milling and paving begins. Section 108 – Prosecution and Progress 108.08 C-1 establishes a 180 calendar day time period for the contractor to complete all paving operations once milling and paving begins.
2) Section 150.11 I establishes time restrictions for allowable lane closures.

Alternative:

1) Eliminate all the notes outlining Prosecution and Progress from Section 150 and the General Notes.
2) Add a note specifying that no daytime lane closures will be allowed.

Opportunities:

- Provide more clarity in the contract documents.

Risks:

- None Identified

Technical Discussion:

In general it appears there are some ambiguities and conflicts between the notes in Section 108, Section 150, and the General Notes. These should be thoroughly reviewed for completeness and consistency.

Value Analysis Project Recommendation

PROJECT:	**Georgia Department of Transportation** **CSNHS-M0043-00(996) – P.I. No. M003996** **Fulton & Clayton Counties** **I-75 / SR 401 Resurfacing**	ALTERNATIVE NO. **3**
DESCRIPTION:	**Coordinate LD language between Section 108 and Section 150; increase liquidated damages for lane closures.**	SHEET NO.: **1** of **1**

Original Design:

The liquidated damages clauses of the Special Provisions Subsection 108.08 appear to be inadequate for the scope and location of this project.
The General Notes also refer to liquidated damages defined in § 108.08; however, some of the items cited from the General Notes are not defined within § 108.08.

Alternative:

The recommendation is to revise and coordinate the liquidated damages provisions language. Specifically:

1. Coordinate General Notes and Special Provisions to ensure that liquidated damages language is consistent, and in agreement.
2. Increase the liquidated damages defined within § 108.08 to be consistent with other projects within the Atlanta central core area. Penalties should be sufficient to incentivize the contractor to minimize, if not avoid in entirety, extending lane closures past defined work hours.
3. Remove the references to § 108.08 from within Special Provisions Section 150.

Opportunities:

- Contractor sufficiently incentivized to comply with GDOT defined work restrictions

Risks:

- None apparent

Technical Discussion:

Coordination of General Notes with the Special Provisions:
The General Notes refer to § 108.08 for liquidated damages as follows:

- GN-4, paving operations completion
- GN-5, covering milled areas
- GN-9, permanent striping start and completion
- GN-13, guardrails
- GN-21, earth shoulders

General Note no. 21 is not applicable and should be deleted. No earth shoulder work is defined as to be performed within the project limits. There are no requirements for liquidated damages related to earth shoulders.

General Note no. 13 refers to § 108.08 for guardrail related work; however, there is no

Value Analysis Project Recommendation

PROJECT:	**Georgia Department of Transportation CSNHS-M0043-00(996) – P.I. No. M003996 Fulton & Clayton Counties I-75 / SR 401 Resurfacing**	ALTERNATIVE NO. **3**
DESCRIPTION:	**Coordinate LD language between Section 108 and Section 150; increase liquidated damages for lane closures.**	SHEET NO.: **1** of **1**

corresponding component within § 108.08. An appropriate liquidated damages item should be added to § 108.08.

Increase Values for Liquidated Damages:

Per Subsection 108.08, the defined liquidated damages for this project are as follows:

1. Failure to same day cover each milled area assessed at $1,000.00 per calendar day.
2. Failure to complete all paving operations within "180" calendar days, from the start date, assessed at $500.00 per calendar day.
3. Failure to complete permanent striping within 45 calendar days assessed at $1,000.00 per calendar day.
4. Failure to replace / restore Traffic Loops on time assessed at $500.00 per hour.
5. Failure to reopen lanes on time assessed at $1000.00 per hour.

Increase LD's sufficiently to ensure that the contractor will be more likely to complete work on time, and not extend past the defined limits to avoid undue traffic lane closures.

Suggested revised liquidated damages values:

- $10,000 per hour for failure to reopen lane closures on time.
- $25,000 per day for failure to complete paving and striping operations on time.
- $10,000 per day for failure to cover milled areas.
- $10,000 per day for failure to complete guardrail work, assessed at each guardrail replacement location not completed within two weeks (14 calendar days).

Special Provision Section 150, Traffic Control:

The repeated references to Subsection 108.08 within Subsection 150 appear to be unnecessary. The language within SP Section 150 should be limited to traffic control requirements and restrictions.

The General Notes summarize the work scope and refer to the special provision sections and subsections, including both liquidated damages defined within § 108.08 as well as traffic controls defined within Section 150.

Delete all references to § 108.08 from within Section 150 to avoid the potential for uncoordinated requirements and avoid potential contractor claims opportunities.

Value Analysis Project Recommendation

PROJECT:	**Georgia Department of Transportation** **CSNHS-M0043-00(996) – P.I. No. M003996** **Fulton & Clayton Counties** **I-75 / SR 401 Resurfacing**	ALTERNATIVE NO.: **5**
DESCRIPTION:	**Delete engineer's office**	SHEET NO.: **1** of **1**

Original Design:

The roadway estimate includes an allowance for a Field Engineer's Office, as a project expense item. (See item no. 153-1300: quantity 1 each; Field Engineers Office TP 3; $69,892.88)

Alternative:

Delete the Field Engineer's office. GDOT and contractor personnel to use local offices for all administrative and construction management activities.

Opportunities:

- Reduced project cost ($70k)

Risks:

- None apparent

Technical Discussion:

Establishing a field engineer's office would be necessary if this project was a major construction activity. However, since the work scope is a maintenance milling and inlay effort there is no apparent requirement to have onsite engineering support.

A field office will require 60-120 days to obtain clearances and permits, as well as to place temporary utilities. Suitable land area required to site the offices and vehicle parking area would need to be located within the vicinity of the project.

VALUE ENGINEERING PROCESS

The Value Engineering team followed the seven step Value Engineering job plan as promulgated by SAVE International. This seven step job plan includes the following:

- Investigative
- Analysis
- Speculation
- Evaluation
- Development
- Recommendation
- VE Report

VALUE ENGINEERING STUDY AGENDA

For

Georgia Department of Transportation

CSNHS-M003-00(996) – P.I. No. M003996

Fulton & Clayton Counties
I-75 / SR 401Resurfacing

May 8, 2009

Pre-Workshop Activities

VE Team Leader organizes study, coordinates with the Owner and Designer about the project objectives and materials. The VE Team receives and reviews all project documents.

8:30-9:00 Project Overview (Information Phase)

- Introduction of participants
- Presentation of the project by GDOT
  - Current Construction Completion Schedule
  - Project Cost Estimate and Budget Constraints
- Discussion, questions and answers

- Overview of the VE Process and Agenda – Workshop goals & project goals

Value Engineering Study Agenda (continued)

9:00-10:00 VE Team reviews project (Information Phase)

- Review GDOT's presentation
- Review Cost Estimate
- Review plans

10:00-10:30 Function Analysis Phase

- Identify basic and secondary functions
- Complete Function Matrix/FAST Diagram

10:30-11:30 Creative Phase

- Brainstorming of alternative ideas

11:30-12:30 Evaluation Phase

- Establish criteria for evaluation
- Rank ideas
- Identify "best" ideas for development
- Identify a "champion" for each idea to be developed

1:30-5:00 Development Phase

- Develop alternative ideas with assessment of original design and write up new alternatives including:
    - Opportunities & risks
    - Technical Discussion

Post-Workshop Activities

Team Leader prepares and writes report. The team members review report. Then the report is published and delivered to the client.

Function Analysis System Technique
(FAST DIAGRAM)

Georgia Department of Transportation

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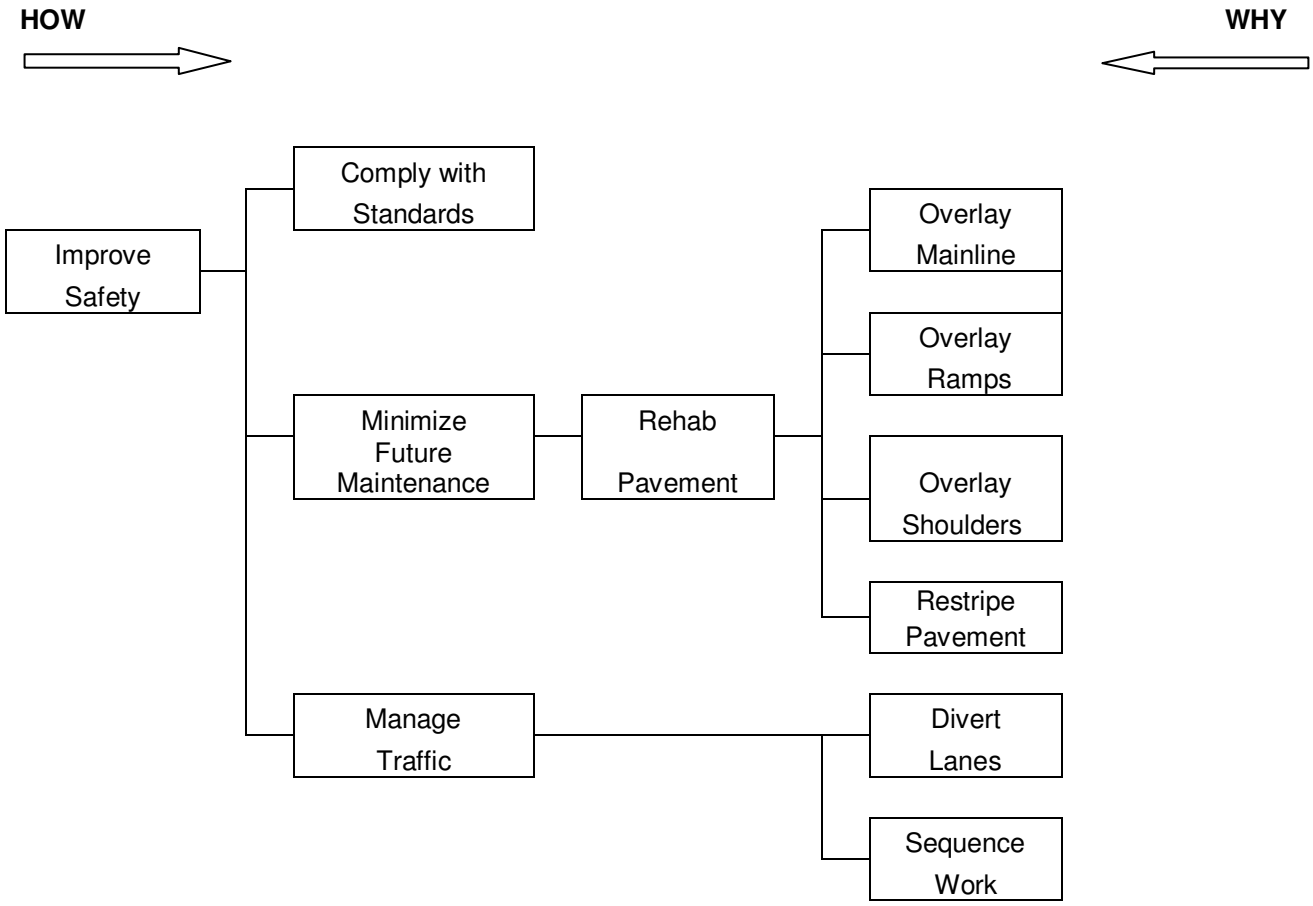

VE Value Engineering Study

MEETING PARTICIPANTS

Georgia Department of Transportation **May 8, 2009**

CSNHS-M003-(nnnnn) - P.I. No. M003996 - I75 / SR 401 Fulton/Clayton Counties

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CREATIVE IDEA LISTING

PROJECT: **Georgia Department of Transportation**
CSNHS-M0043-00(996) – P.I. No. M003996
Fulton & Clayton Counties
I-75 / SR 401 Resurfacing

SHEET NO.: **1** of **1**

NO.	DESCRIPTION OF RECOMMENDATION	RATING
1	Use OGFC in lieu of PEM	4
2	Review special provisions section 150 – Traffic Control	5
3	Coordinate liquidated damages language between special provisions section 108 and section 150.	5
4	Allow daytime work within the vicinity of ramps	2
5	Delete engineers office	5
6	Increase LD's for lane closures	C w/ #3

Rating: 1→2 = Not to be Developed; 3 = Varying Degrees of Development Potential; 4→5 = Most likely to be Developed
C = Combined With (Idea Number); DS = Design Suggestion; ABD = Already Being Done; OB= Observation